

BACHELOR OF ARCHITECTURE (B.Arch.)

Term-End Examination

00345

December, 2014

BAR-029 : ARCHITECTURAL SCIENCES AND SERVICES – I (CLIMATOLOGY)

Time : 3 hours

Maximum Marks : 70

Note : Section A is compulsory. Answer any two questions from Section B. Use of scientific calculator is permitted. Supplement your answers with sketches wherever necessary.

SECTION A

1. (a) With reference to any **four** of the figures given below, answer the following : $4 \times 3 = 12$
- (i) Identify the geographical locations and prevailing climate.
 - (ii) Explain about the choice of building material used and form evolved.

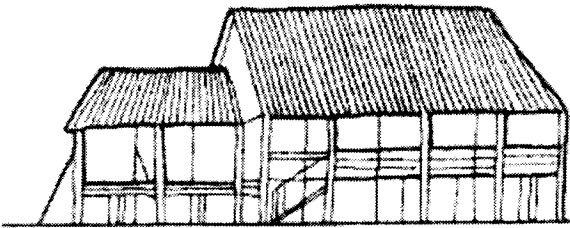


Fig. (i) Airy shelters



Fig. (ii) Bedouin Tents

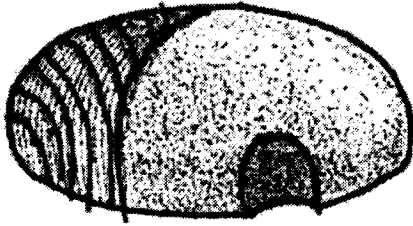


Fig. (iii) Zulu Hut

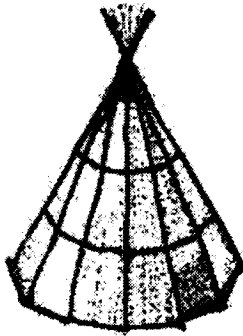


Fig. (iv) Wigwam

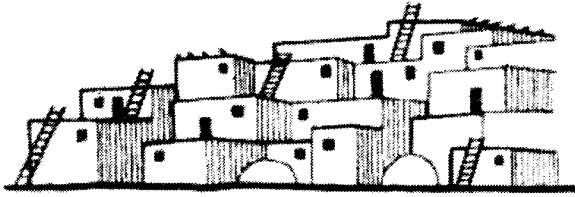


Fig. (v) Monolithic Dwellings

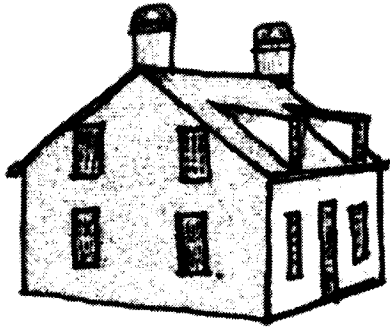


Fig. (vi) Colonial House, 18th century

- (b) Explain the following in brief : 6×3=18
- (i) Shadow Angles
 - (ii) Time Lag and Decrement Factor
 - (iii) Design sky concept
 - (iv) Daylight protractors
 - (v) Windrose diagrams
 - (vi) Any one method of providing DPC for walls (with sketches)

SECTION B

Answer any **two** of the following questions :

2. (a) Explain the following :
- (i) Climatic analysis with CET. 9
 - (ii) Influence of subjective variables on the sensation of comfort. 6
- (b) Explain 'sky component' of daylight factor. 5
3. (a) What is a solar chart ? What are the information that can be obtained from solar charts ? 5
- (b) Find U-value for 19 cm brick outside wall insulated with 2.5 cm expanded polystyrene and finished on both sides with 1.0 cm cement plaster. Show the section of the wall. 10
- 'K' for brick wall = 0.811 W/(mK)
'K' for plastering = 0.721 W/(mK)
'K' for expanded polystyrene = 0.035 W/(mK)
 $f_o = 19.86, f_i = 9.36$
- (c) Explain briefly on daylighting requirements. 5
4. (a) What is comfort ventilation ? Explain the influence of location and size of openings, internal partition walls, shading devices and external obstructions on the air movement through the interiors of a building. 15
- (b) With the help of examples, briefly explain the different techniques to be adopted for solar passive heating in a cold hilly area. 5